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9797-134

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25X1A

[redacted]

25X1A [redacted]

25X1A Dear [redacted]

I am writing to you regarding two of your model 405B Chip Comparators that were installed in our facility in November 1965. As you know, you developed this equipment for us under contract, and we note with pride and interest that you have made it commercially available.

This comparator was conceived by our Staff and well designed and executed by your engineers. Consequently, it has received better than average interest by the operational personnel for whom it was intended. However, this interest is rapidly turning to reluctance due to the unreliable performance of the equipment.

In order to acquaint you with the extent of maintenance and downtime this equipment has required I am enclosing two memoranda from our maintenance personnel who are responsible for keeping our equipment in operational condition, whether it be through warranty services, maintenance contracts, or through their own capabilities. These memoranda speak for themselves. In summary, they say that these comparators have never been capable of any extended period of reliable operation, even with frequent visits by your maintenance personnel, and more frequent adjustments and minor maintenance by ours. The net result of this situation is that the operators have lost confidence in the equipment.

It seems to us that there is no point in continuing this process of frequent maintenance with excessive downtime. We believe that the comparator is basically sound from a mechanical and optical standpoint and that the source of trouble lies in the interferometer and its interface with the electronic logic. We believe that a thorough and competent engineering analysis of this system is called for, followed by remedial action to

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correct the situation. We are vitally interested in making use of this equipment and protecting the Government's investment; I would appreciate hearing from you on this matter at your earliest convenience.

25X1A

[redacted]

Assistant for Plans and Development, NPIC

Enclosures:
(1) Memorandum for the Record
dated 18 May 1966
(2) Memorandum for the Record
dated 20 May 1966

Distribution:
Original and 1 - Addressee
1 - P&DS
2 - P&DS/DB File

25X1A NPIC/P&DS/DB: [redacted] (6 July 1966)

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NPIC/P&DS/D/6-1375
18 May 1966

MEMORANDUM FOR THE RECORD

SUBJECT: Maintenance History of Chip Comparator Model 405-B
Serial No. 1 installed in IAD

1. Subject instrument was installed in November 1965. It has required adjustment to correct counting errors constantly since that time. Adjustment of both Interferometer and [redacted] Trigger circuits are necessary. 25X1A

2. Maintenance requests to EPS for correction do not accurately reflect the actual up-time of this instrument due to infrequent use. The sequence of events preceding a service call has been as follows:

a. EPS adjusts and checks instrument. IAD may or may not use instrument the same day.

b. EPS checks instrument the following day. Usually it is still counting correctly, but not always.

c. The next time IAD attemps to use the instrument (may not be for several days), it is not counting correctly in one or both axes.

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3. On February 8, 1966, [redacted], a representative of [redacted] Inc., performed the following maintenance on the Chip Comparator. 25X1A

a. Increased the output of the high voltage circuit for both the X and Y axis.

b. Replaced a printed circuit board in the X axis circuit.

c. Adjusted the D.C. level of interferometer output signals for both axes.

d. Adjusted [redacted] Trigger circuits for both axes. 25X1A

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4. [redacted] was questioned as to why the interferometer circuits required frequent adjustment. He felt that changes in ambient temperature or line voltage fluctuations could be the cause, however, he had not experienced this problem at other [redacted] installations. 25X1A

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5. Since sufficient data to isolate the problem could not be obtained during [redacted] visit, EPS agreed to maintain a detailed record of future counting problems. He supplied a spare line voltage regulator to be used to determine if voltage fluctuation was responsible. EPS connected the regulator, but no improvement resulted.

6. IAD agreed to make daily tests to help determine actual up-time of the instrument, but they did not follow through. However, spot checks by EPS showed that the counting problem still existed.

7. After approximately one month, [redacted] was informed that the counting circuits still required frequent adjustment, and on 3 and 4 March 1966, he returned to perform a series of tests. During his checks he repaired bad solder connections in the oscillator power supplies of both axes and replaced a bad capacitor in the Y-axis Schmidt circuit. He then set up both axes and, after overnight operation obtained the following results. 25X1A

a. Y-axis electrical drift was within tolerances.

b. X-axis electrical drift was within tolerances.

c. X-axis interferometer optics could not be aligned to allow an adequate safety factor.

d. X-axis mercury lamp output appeared to be low.

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8. [redacted] concluded that the X-axis interferometer optics required replacement, but he would have to return later for this operation. Both axes were operating when he left at 1615 on 4 March 1966. A check by EPS at 1000 on 7 March 1966, found the X-axis to be inoperative. Adjustments could not be made due to the faulty interferometer optics.

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9. On 5 and 6 April 1966, [redacted] made the following repairs on the comparator. 25X1A

a. Replaced X-axis mercury lamp.

b. Replaced X-axis corner cube.

c. Aligned interferometer optics and digitizer circuits.

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10. Both axes were operating when they departed on 6 April, and a check by EPS on 9 April showed that the axes were still operating correctly. However, on 11 April both axes required adjustment of the [redacted] circuits to compensate for interferometer signal level shift. 25X1

11. During the remainder of the month of April, IAD did not use the instrument due to lack of confidence. Spot checks three times by EPS discovered the need for adjustment of both axes. EPS made the necessary adjustments.

12. On 5 May 1966, a spot check by EPS found both axes not counting correctly. The X-axis could not be adjusted due to insufficient signal amplitude near the stage limits. [redacted] was informed that the X-axis was still malfunctioning, and on 11 May 1966, [redacted] removed the X-axis interferometer and took it to his plant for study. 25X1A 25X1A

25X1A
[redacted]
Equipment Performance Section, DB/P&DS

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NPIC/P&DS/D/6-1386
20 May 1966

MEMORANDUM FOR THE RECORD

RBK

SUBJECT: Maintenance History of Chip Comparator Model 405-B Serial No. 2 installed in TID

1. Subject instrument was installed by [redacted] 25X1A, in November 1965. Due to lack of suitable teletype equipment it could not be utilized until May 1966. During this six month period, room temperature was maintained within operational (± 1°) limits.

2. On 9 May 1966, prior to setting up and checking out on-line operation, EPS observed that both axes were not counting correctly. On 10 May, EPS adjusted X and Y interferometer signal levels and [redacted] circuits to specifications, and accurate counting was obtained. 25X1A

3. On 11 May, a spot check by EPS found that the Y axis was not counting at all, but the X axis was correct. EPS made the necessary adjustments to the Y-axis interferometer and Schmidt circuits. On 12 May, an identical situation was found and corrected in a like manner.

4. On 13 May, at 0900, both counters were checked and found to be operating satisfactorily. This was the first time correct operation was obtained over a 24-hour period.

5. No checks were made during the week-end of 14-15 May, but on 16 May, both axes were found to be counting incorrectly. Based on similar problems with Chip Comparator Model 405-B, Serial No. 1, for which no solution has yet been found, EPS decided that further adjustment would be futile.

6. During the period of these checks and adjustments the equipment was left on 24-hours per day and room temperature was maintained within specified limits.

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[redacted]
Equipment Performance Section, DB/P&DS

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